

## REMARKS

This communication is a full and timely response to the final Office Action dated October 9, 2008. Claims 1-3, 5-23, 25-28, and 31-38 remain pending, where claims 4, 24, 29, and 30 were previously cancelled. By this communication, claims 1, 2, 5, 8, 25, 33, and 34 are amended and claims 35-38 are added. Support for the amended subject matter can be found, for example, at page 9, lines 16-27 and at page 22, lines 22-23 of the disclosure.

Applicants' appreciate the Examiner's acknowledgement that claim 8 is allowable.

On page 2 of the Office Action, the Examiner objected to the title of the invention for allegedly being non-descriptive of the invention. Applicants respectfully traverse this rejection. However, in an effort to expedite prosecution the title is amended to address the Examiner's concerns. Withdrawal of this objection is respectfully requested.

Beginning on page 3 of the Office Action, claims 1, 2, 5, 6, 9-15, 25, and 31-33 stand rejected under 35 U.S.C. §103(a) for alleged unpatentability over *Plante* (U.S. Patent No. 4,655,563) in view of *Clemino* (U.S. Patent No. 4,670,338). Applicants respectfully traverse this rejection.

The *Plante* and *Clemino* patents fail to disclose or suggest every element recited in Applicants' claims.

Independent claim 1 is amended to recite:

A mirror structure comprising:  
a self-deforming mirror mounted on a passive flexible support structure said mirror having a piezo electric actuator that is bonded to a mirror substrate  
the support structure comprising, one or more passive flexible support elements attached to the piezo electric actuator or arranged to provide a supporting surface on which the self-deforming mirror is mounted, wherein the support structure is arranged to enable a deformation response in the self-deforming mirror mounted thereon.

The *Plante* patent discloses a deformable mirror in which a plurality of electrically-operative electrodistortive actuators may be used to selectively deform the mirror's reflecting surface. As shown in Figure 1, the deformable mirror is supported by three pairs of kinematic bi-pod mounts. Each mount 20 includes a pair of variable length actuators 22 and 24, which (actuators) are pinned at one end to the supports on which the deformable mirror is mounted. The angle and distance between each pair of actuators for each kinematic mount are chosen so that the reaction force generated by the kinematic mounts in supporting the mirror act through the neutral axis of the mirror

*Clemino* discloses a mirror substrate having two glass plates 10 and 12 which are glued to either side of an intermediate structure 14. The intermediate structure 14 has a central core 16, a first set 18 of blocks of glass foam (with each block being glued between the inside face of the plate glass 10 and one of the two faces of the central core 16), and a second set 20 of blocks of glass foam (with each block being glued between the inside face of the plate glass 12 and the other face of the central core 16) (column 4, lines 31-41; Figure 1).

Neither reference, however, discloses a mirror structure that comprises at least a self-deforming mirror having a piezo electric actuator that is bonded to a

mirror substrate, as recited in claim 1, or a feature that could be reasonably interpreted as such.

In summary, Plante and Clemino when applied individually or collectively fail to disclose or suggest every element and/or the combination of elements recited in Applicants' claims. For at least this reason, a *prima facie* case of obviousness has not been established.

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. In *re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Moreover, obviousness "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys. V. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Based on the foregoing discussion, withdrawal of the rejection of Applicants' claims under 35 U.S.C. §103 is respectfully requested.

Claims 35-38 are newly added. Applicants respectfully submit that claims 35-37 are distinguishable over the applied reference by virtue of their dependency from claim 1 and because of the additional features recited therein.

Independent claim 38 recites, among other features, a mirror structure comprising a self-deforming mirror, the self-deforming mirror having a mirror substrate and at least one morphing layer bonded to the substrate and actuable to deform the mirror substrate. None of the documents of record disclose or suggest the aforementioned combination of features. For at least these reasons, favorable consideration and allowance of claims 35-38 are respectfully requested.

**Conclusion**

Based on the foregoing amendments and remarks, Applicants respectfully submit that claims 1-3, 5-23, 25-28, and 31-38 are allowable and this application is in condition for allowance. In the event any unresolved issues remain, the Examiner is invited to contact Applicants' representative identified below.

Respectfully submitted,

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